CALIFORNIA HYDROGEN HIGHWAY NETWORK

HYDROGEN CARS AND BUSES

Hydrogen cars will help us limit smog forming and greenhouse gas emissions, reduce our dependence on petroleum and provide economic benefits for our State.

All of the world's major auto manufacturers have well-established hydrogen vehicle research and development projects and California is the hub of most of these activities. According to the California Fuel Cell Partnership, since 2000, over 250 light-duty fuel cell cars have been placed in California, and have traveled more than 2 million miles. Automakers are now placing vehicles with fleets and consumers primarily in the Los Angeles area, but also in the San Francisco Bay Area and Sacramento in fleet applications.

There are two types of cars that can use hydrogen as a fuel, fuel cell vehicles (FCV) and hydrogen internal combustion engine (ICE) vehicles. A fuel cell car uses a fuel cell to provide electricity to an electric drive motor. Fuel cells are an electrochemical device that produces electricity efficiently, silently and without combustion. Hydrogen is combined with oxygen (from air) to produce electrical energy. These vehicles are at least two times more efficient than their gasoline counterparts, therefore they can go at least twice as far on the energy equivalent of a gallon of gasoline.

With some modifications, vehicles with an internal combustion engine (ICE) can use hydrogen as a fuel. Hydrogen burns much cleaner than gasoline which makes hydrogen ICEs a possible near-term transition technology. However, hydrogen ICE vehicles still have some emissions, making fuel cells, with higher efficiencies and zero emissions, the long term goal.

Although manufacturers have made many advances in fuel cell technologies in the past few years, major milestones must still be achieved in order for fuel cells to compete with current vehicles on the market and provide maximum benefits to the State. These include:

- Prove the reliability and durability of the fuel cell
- Increase range by improving how hydrogen is stored on board the vehicle
- Reduce the cost of building fuel cell vehicles to be competitive with today's cars

Development of infrastructure to support wide-scale vehicle introduction

Successes are happening in many of these areas. For instance, several of today's fuel cell vehicles have ranges in excess of 250 miles, which already meets the Department of Energy's 2010 range goal. Durability goals are also making progress. Today's fuel cell vehicles have demonstrated 1200 hours of durability, well on their way to accumulating the 2,000 hour durability DOE would like to see demonstrated by 2009. As with any new technology, commercialization of hydrogen vehicles will take time and careful planning. Automakers predict this happening between 2015 and 2020.

For More Information

If you would like to learn more about the hydrogen vehicles and buses as well as demonstration programs happening in California, please visit the California Hydrogen Highway web site at www.HydrogenHighway.ca.gov.